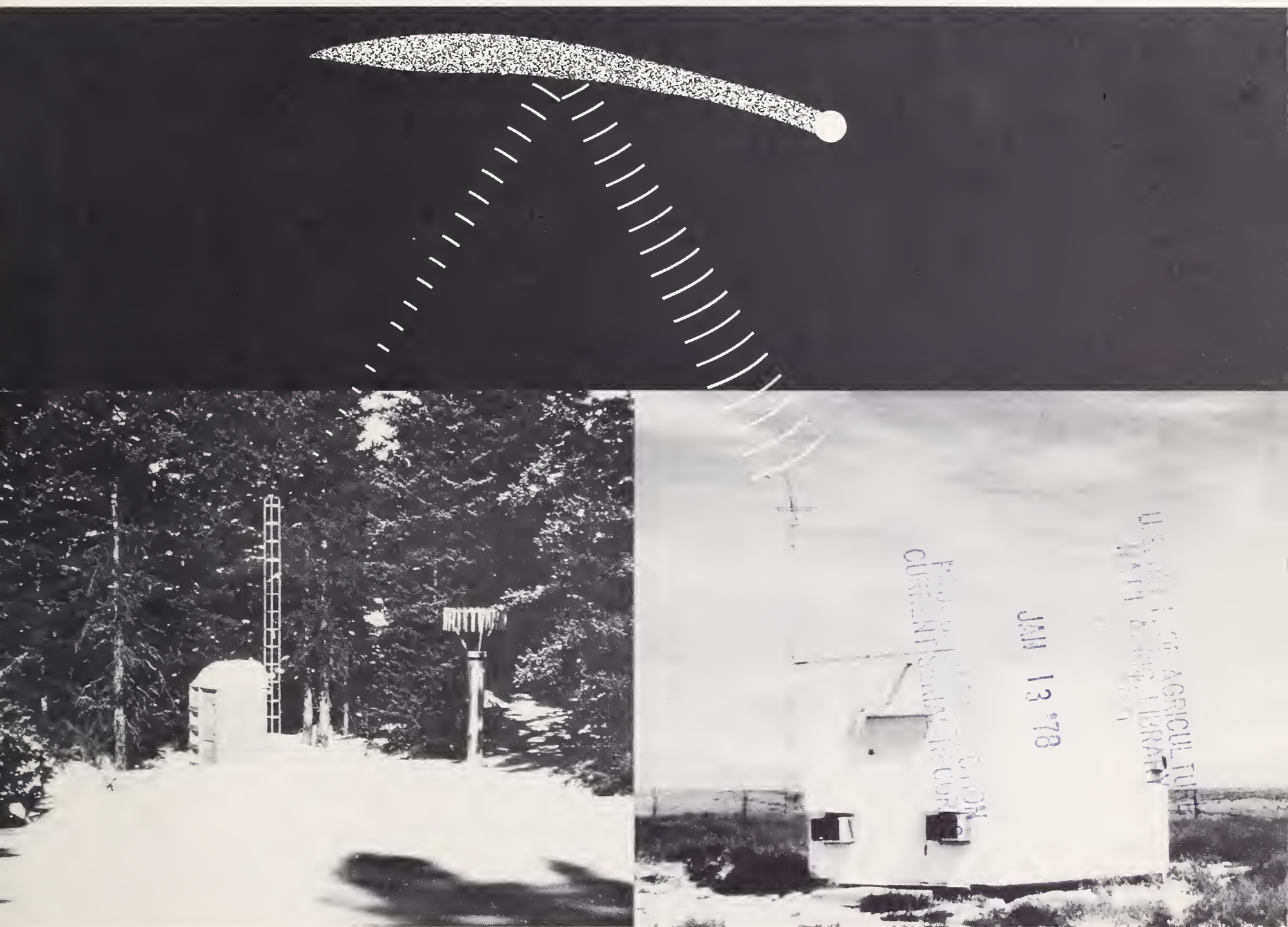


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WATER SUPPLY OUTLOOK FOR MONTANA



U. S. DEPARTMENT of AGRICULTURE ★ SOIL CONSERVATION SERVICE

Collaborating with
MONTANA AGRICULTURAL EXPERIMENT STATION

Data included in this report were obtained by the agencies named above in cooperation with Federal, State and private organizations listed inside the back cover of this report.

AS OF
JAN. 1, 1978

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: SOME OF THE DATA IN THIS REPORT HAVE BEEN RECEIVED THROUGH THE SOIL CONSERVATION SERVICE'S NEW SNOTEL SYSTEM WHICH TRANSMITS INFORMATION VIA THE SPACE AGED METEOR BURST METHOD FROM DATA SITES TO MASTER STATIONS LIKE THESE.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno Nevada 89505
Oregon	1220 S.W. Third Ave., Portland, Oregon 97204
Utah	4012 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U.S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Water Supply Forecast and Snow Surveys Unit, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.



WATER SUPPLY OUTLOOK FOR MONTANA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

Issued by

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In Cooperation with

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MONTANA WATER SUPPLY OUTLOOK

January 1, 1977

* * * * *

* Mountain snowfall so far this winter has been a complete reversal from last year's low levels. Most areas in Montana have above average water stored in the snow pack. Many locations have the highest January 1 water content of record. About one-half of the 100-plus snow courses measured this month have more water now than they recorded for all of last season. Two areas in the state have subnormal snow, the extreme headwaters of the Red Rock River in Southwestern Montana and the northeastern flank of the Beartooth Mountains near Red Lodge.

* The prospects for a good runoff this spring and summer appears to be good at this time. Normally about 40 percent of the season's snow accumulation should be on the ground by this time.

* Additional snow surveys will be made at about one-half of the state's 250 snow courses near the first of February. Almost all of the snow courses will be measured near March 1.

* * * * *

COLUMBIA RIVER DRAINAGE

Snow. The mountain snow pack has been accumulating at record, or near record levels so far this season. The heaviest snow accumulation based on percentages has occurred in the Bitterroot River drainage. The Kootenai, Flathead and Upper Clark Fork have snow packs that vary from slightly above to much above average. Soil moisture under the snow pack is near normal.

Streamflow. No volume forecasts are issued this month, however, based on current snow pack and soil moisture levels spring and summer streamflow should be above average.

MISSOURI RIVER DRAINAGE

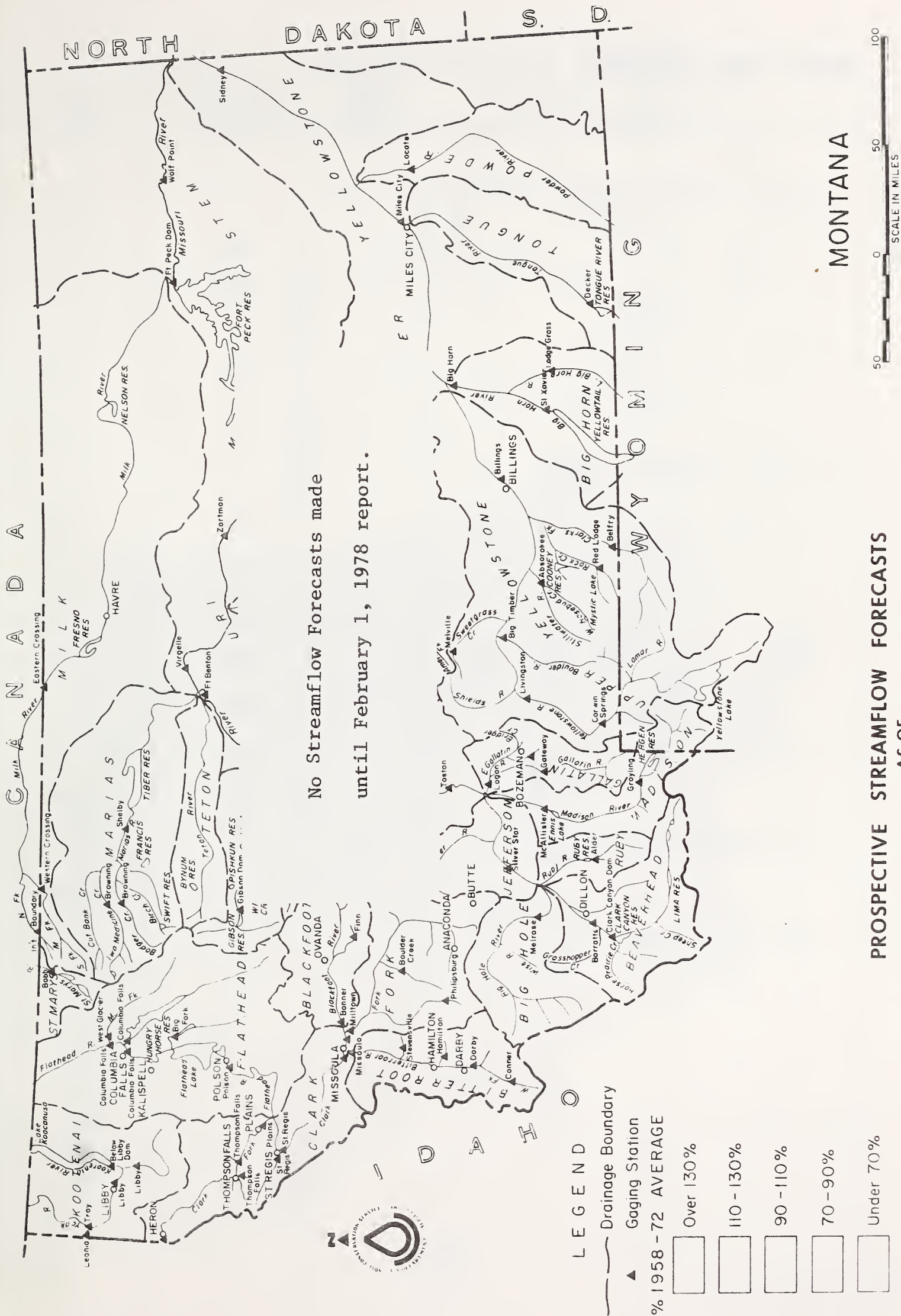
Snow. There is extreme variation in the snow pack over the drainage. Many areas show record, or near record amounts of water content in the snow pack. In contrast, the extreme headwaters of the Red Rock River along the Montana-Idaho border has only about one-half the normal snow pack. In general, most areas have above average snow water content and more water in the snow pack now than there was at any time last season. Soils under the snowpack generally have near average moisture levels.

Streamflow. No forecasts are issued this month, however, current snow pack and soil moisture would indicate above to well above average runoff from most drainages.

YELLOWSTONE RIVER DRAINAGE

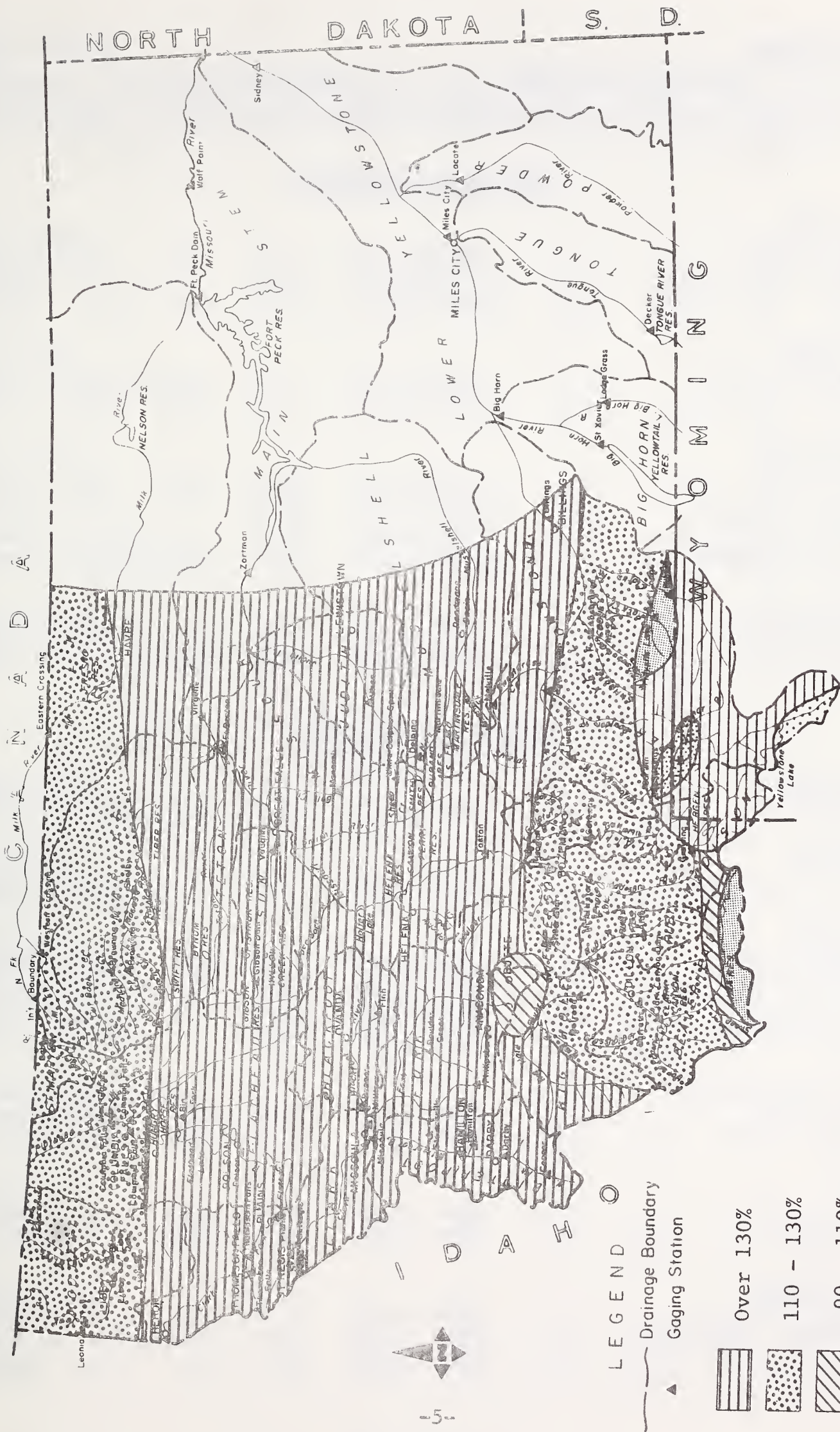
Snow. In general the mountain snow pack is above average. Some areas are above average while others are near average. The area near Red Lodge has about two-thirds the average snow pack. Soils generally have near average to slightly below average moisture levels.

Streamflow. No forecasts are issued this month. However, current snow pack and soil moisture levels would indicate near average to above average runoff in most drainages.



SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF:	
		Last Year	Average
<u>COLUMBIA RIVER DRAINAGE</u>			
Kootenai	4	260	128
Flathead	9	277	131
Upper Clark Fork	15	417	153
Lower Clark Fork	4	454	144
Bitterroot	5	426	192
<u>MISSOURI RIVER DRAINAGE</u>			
Jefferson	17	470	139
Madison	11	458	129
Gallatin	12	290	131
Missouri Main Stem	6	263	156
Judith-Musselshell	2	205	167
Marias-Teton-Sun	3	269	121
Milk	3	333	165
<u>YELLOWSTONE RIVER DRAINAGE</u>			
Yellowstone (above Big Horn)	14	320	153
<u>SASKATCHEWAN RIVER DRAINAGE</u>			
St. Mary's	1	314	114
-4-			



MONTANA

MOUNTAIN SNOW WATER EQUIVALENT

AS OF

January 1, 1978



LEGEND
 — Drainage Boundary
 ▲ Gaging Station

- Over 130%
- 110 - 130%
- 90 - 110%
- 70 - 90%
- Under 70%



SOIL MOISTURE

NOVEMBER

DRAINAGE BASIN and/or STATION		Profile (Inches)		Date of Survey	Soil Moisture (Inches)		
Name	Elevation	Depth	Capacity		This Year	Last Year	Average †

COLUMBIA RIVER BASINKootenai

Baree Trail	3800	48	7.5	11/1	6.1	4.4	5.5
Murphy Lake R. S.	3000	48	22.6	-	-	18.9	18.8
Raven	3050	48	23.0	11/1	14.1	13.5	15.9

Flathead

Desert Mountain	5600	54	8.4	10/26	7.1	5.2	6.5
Marias Pass	5250	54	6.5	10/19	5.5	3.4	4.4

Clark Fork

Black Pine	7100	48	10.0	10/31	8.3	7.8	7.9
Lubrecht Forest	4100	48	26.8	-	-	14.3	14.7
Seeley Lake R. S.	4030	48	11.9	-	-	4.9	4.9
Skalkaho Summit	7260	48	10.8	10/31	10.2	9.7	10.1

Bitterroot

Gibbons Pass	7100	48	7.1	-	-	6.1	4.9
Lolo Pass	5250	48	10.6	10/31	6.3	7.0	5.4

MISSOURI RIVER BASINBeaverhead

Lakeview	6700	48	15.3	10/31	13.1	11.6	8.8
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Madison

West Yellowstone	6700	48	6.5	-	-	2.5	2.6
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Gallatin

Bridger Bowl	7250	48	17.0	11/3	14.9	14.8	15.4
College Site No. 2	4860	48	17.7	11/4	10.1	11.2	11.3
Lick Creek	6860	48	18.8	11/3	13.8	14.6	16.4
Twenty-One Mile	7150	48	10.0	-	-	4.3	5.0

Missouri Main Stem

Kings Hill	7420	48	11.8	11/2	10.0	-	7.8
Stemple Pass	6350	48	5.9	10/31	4.4	3.1	4.0

Milk

Beaver Creek	3950	48	20.9	10/28	7.6	6.7	7.6
Rocky Boy	4700	36	10.1	10/28	7.7	6.1	7.6

Yellowstone

Battle Ridge	6020	48	17.6	11/3	14.5	9.0	11.6
Northeast Entrance	7350	48	9.4	11/5	7.7	6.9	6.5
PMC Dryland	3700	48	20.7	11/3	4.9	5.3	6.0

SOIL MOISTURE

DECEMBER

DRAINAGE BASIN and/or STATION		Profile (Inches)		Date of Survey	Soil Moisture (Inches)		
Name	Elevation	Depth	Capacity		This Year	Last Year	Average †

COLUMBIA RIVER BASINKootenai

Baree Trail	3800	48	7.5	12/1	6.6	5.4	6.2
Murphy Lake R. S.	3000	48	22.6	12/1	19.2	19.0	19.2
Raven	3050	48	23.0	12/1	15.3	13.7	17.3

Flathead

Desert Mountain	5600	54	8.4	-	-	-	-
Marias Pass	5250	54	6.5	11/28	6.1	3.6	4.8

Clark Fork

Black Pine	7100	48	10.0	11/29	7.7	6.8	7.8
Lubrecht Forest	4100	48	26.8	-	-	14.3	15.6
Seeley Lake R. S.	4030	48	11.9	12/5	8.1	5.1	5.8
Skalkaho Summit	7260	48	10.8	11/30	10.3	8.6	9.5

Bitterroot

Gibbons Pass	7100	48	7.1	12/2	5.9	4.6	4.8
Lolo Pass	5250	48	10.6	11/29	7.6	7.4	6.0

MISSOURI RIVER BASINBeaverhead

Lakeview	6700	48	15.3	11/31	11.0	10.0	9.5
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Madison

West Yellowstone	6700	48	6.5	12/1	2.4	1.8	2.5
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Gallatin

Bridger Bowl	7250	48	17.0	12/1	14.9	14.4	15.3
College Site No. 2	4860	48	17.7	12/2	12.1	10.2	13.0
Lick Creek	6860	48	18.8	12/1	13.8	13.5	15.9
Twenty-One Mile	7150	48	10.0	12/5	6.3	5.0	4.6

Missouri Main Stem

Kings Hill	7420	48	11.8	11/30	8.3	5.3	7.3
Stemple Pass	6350	48	5.9	12/1	4.1	3.0	4.0

Milk

Beaver Creek	3950	48	20.9	11/29	7.7	6.6	7.5
Rocky Boy	4700	36	10.1	11/29	7.2	6.2	7.7

Yellowstone

Battle Ridge	6020	48	17.6	12/1	14.2	9.0	12.5
Northeast Entrance	7350	48	9.4	11/30	7.2	5.7	6.3
PMC Dryland	3700	48	20.7	11/30	5.4	5.7	6.7

SOIL MOISTURE

JANUARY

DRAINAGE BASIN and/or STATION		Profile (Inches)		Date of Survey	Soil Moisture (Inches)		
Name	Elevation	Depth	Capacity		This Year	Last Year	Average †

COLUMBIA RIVER BASINKootenai

Baree Trail	3800	48	7.5	-	-	4.7	6.1
Murphy Lake R. S.	3000	48	22.6	1/3	19.0	19.0	19.4
Raven	3050	48	23.0	1/3	15.9	13.7	17.3

Flathead

Desert Mountain	5600	54	8.4	12/23	7.7	5.2	6.9
Marias Pass	5250	54	6.5	1/3	6.2	3.6	4.8

Clark Fork

Black Pine	7100	48	10.0	12/29	7.9	6.5	7.4
Lubrecht Forest	4100	48	26.8	12/30	15.7	14.0	14.8
Seeley Lake R. S.	4030	48	11.9	1/3	9.8	4.7	6.4
Skalkaho Summit	7260	48	10.8	12/28	10.0	-	-

Bitterroot

Gibbons Pass	7100	48	7.1	12/29	6.0	3.6	4.6
Lolo Pass	5250	48	10.6	-	-	6.9	6.0

MISSOURI RIVER BASINBeaverhead

Lakeview	6700	48	15.3	12/30	12.6	8.1	9.3
----------	------	----	------	-------	------	-----	-----

Madison

West Yellowstone	6700	48	6.5	12/27	2.6	1.3	2.4
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Gallatin

Bridger Bowl	7250	48	17.0	12/29	14.9	15.6	15.5
College Site No. 2	4860	48	17.7	-	-	8.6	13.0
Lick Creek	6860	48	18.8	12/28	13.8	-	15.5
Twenty-One Mile	7150	48	10.0	12/27	6.3	2.2	4.2

Missouri Main Stem

Kings Hill	7420	48	11.8	12/27	11.0	4.8	7.0
Stemple Pass	6350	48	5.9	1/3	4.5	3.3	4.0

Milk

Beaver Creek	3950	48	20.9	12/29	8.9	8.0	7.6
Rocky Boy	4700	36	10.1	12/29	8.4	6.1	7.3

Yellowstone

Battle Ridge	6020	48	17.6	12/29	14.5	8.6	12.3
Northeast Entrance	7350	48	9.4	12/31	7.1	4.4	6.0
PMC Dryland	3700	48	20.7	12/29	5.7	-	-

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
COLUMBIA RIVER BASIN					
Kootenai	Koocanusa	5,694.0	2,377.0	3,736.0	-
Flathead	Hungry Horse	3,428.0	1,974.0	2,650.0	2,766.0
	Flathead, Lake	1,791.0	1,205.0	1,254.0	1,423.0
	Camas (4)	45.2	-	14.9	22.1
	Mission Valley (8)	100.3	-	43.0	31.4
Clark Fork	Georgetown Lake	31.0	27.2	30.8	27.9
	Lower Willow Creek	4.9	0.8	2.2	1.1
	Nevada Creek	12.6	-	3.9	4.3
	Noxon Rapids	334.6	316.5	322.4	320.5
Bitterroot	Painted Rocks	31.7	9.6	0.0	23.5
	Como	34.9	-	7.3	8.0

MISSOURI RIVER BASIN

Beaverhead	Lima	84.0	-	45.3	31.2
	Clark Canyon	257.2	147.4	157.5	138.9
Ruby	Ruby	38.8	-	17.5	20.0
Madison	Hebgen Lake	337.5	243.2	221.8	201.9
	Ennis Lake	41.0	34.9	34.1	36.7
Gallatin	Middle Creek	8.0	3.3	2.7	3.0
Missouri	Canyon Ferry	2,043.0	1,753.0	1,887.0	1,717.0
	Hauser & Helena	61.9	52.2	62.5	59.6
	Lake Helena	10.4	10.9	10.7	9.6
	Holter Lake	81.9	79.9	79.3	71.3
	Fort Peck Lake	18,910.0	14,590.0	16,641.0	13,450.0
Smith	Smith River	10.6	-	8.0	5.7
	Newlan Creek	12.4	3.5		
Musselshell	Bair	7.0	-	4.2	4.0
	Martinsdale	23.1	-	16.0	7.6
	Deadman's Basin	72.2	-	44.9	41.2
Sun	Gibson	99.0	-	59.0	36.9
	Willow Creek	32.2	-	26.6	18.6
	Pishkun	32.0	-	16.6	17.7
Marias	Lower Two Medicine	11.9	-	-	-
	Four Horns	19.2	-	-	-
	Swift	30.0	6.7	16.2	14.1
	Lake Frances	111.9	27.7	78.7	78.1
	Elwell (Tiber)	1,347.0	519.7	534.3	579.1
Milk	Beaver Creek	3.5	2.2	1.4	-
	Fresno	127.2	-	68.6	59.0
	Nelson	66.8	-	48.7	44.4
St. Mary's	Lake Sherburne	66.2	-	13.3	16.5
Yellowstone	Mystic Lake	21.0	-	5.7	14.1
	Cooney	27.4	10.7	13.1	13.4
	Tongue River	68.0	29.1	36.6	25.8
Big Horn	Big Horn Lake	1,356.0	961.9	947.9	880.8

SNOW

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average
Arch Falls	7350	12/28	26	6.5	2.2	5.5
Badger Pass	6900	12/26	82	27.0A	10.5	21.2
Banfield Mountain Pillow	5600	12/30	SP	10.6	3.1	9.6
Battle Ridge	6020	12/29	24	7.3	1.3	3.0
Basin Creek	7180	12/29	19	2.9	.8	-
Bear Paw Ski Area	5200	12/29	25	6.0	1.6	2.6
Big Coulee	5100	12/28	16	3.7	3.9	-
Big Sky	7700	1/02	30	7.4	3.5	7.2
Big Springs (ID)	6500	12/29	38	11.0	1.8	7.8
Black Bear	7950	12/29	68	21.4	3.7	-
Black Bear Pillow	7590	12/29	SP	19.3	5.7	-
Black Pine	7100	12/29	32	9.7	1.6	3.4
Black Pine Pillow	7100	12/29	SP	9.6	2.0	5.4
Blue Lake	5900	12/26	52	13.5A	5.0	11.8
Bridger Bowl	7250	12/29	56	17.5	5.6	12.0
Bridger Bowl Pillow	7250	12/29	SP	16.9	6.9	13.2
Camp Creek (ID)	6800	12/29	11	2.0	.0	4.3
Canyon (WY)	7750	1/01	44	10.8	3.2	6.5
Carrot Basin	9000	12/28	62	18.0	4.4	17.0
Carrot Basin Pillow	9000	12/28	SP	15.8	4.9	10.9
Chessman Reservoir	6200	1/03	16	3.1	1.3	1.3
Cole Creek	7850	12/27	24	5.1	3.3	-
Cole Creek Pillow	7850	12/27	SP	5.0	4.4	-
Combination	5600	12/29	12	3.0	.8	2.6
Combination Pillow	5600	12/29	SP	2.5	1.8	-
Cooke Station	8150	12/27	59	15.8	4.4	-
Copper Bottom	5200	12/16	22	6.8	2.2	-
Copper Bottom Pillow	5200	12/16	SP	7.5	2.2	-
Daly Creek	5780	12/27	26	6.8	2.0	-
Deadman Creek	6450	12/27	33	8.2	4.9	4.3
Deadman Creek Pillow	6450	12/27	SP	7.9	4.8	4.8
Desert Mountain	5600	12/23	35	8.1	3.8	7.3
Devils Slide	8100	12/28	46	12.5	6.2	10.1
Discovery Basin	7050	12/27	23	5.6	2.3	-
Dix Hill	6400	12/30	33	7.8	2.2	-
East Entrance (WY)	7000	1/01	37	8.0	1.6	4.2
East Fork R.S.	5400	12/21	20	4.2	-	-
Emery Creek	4350	12/23	36	9.0	3.8	-
Emery Creek Pillow	4350	12/23	SP	8.2	3.4	-
Fish Creek	8000	12/29	19	3.4	.9	-
Fisher Creek	9100	12/27	84	25.2	7.9	14.4
Fisher Creek Pillow	9100	12/27	SP	22.8	9.9	14.8
Fourth of July	3450	12/30	26	5.6	.8	-
Friday Hill	4620	12/29	38	11.2	3.8	-
Frohner Meadows	6480	12/29	22	6.2	2.0	-
Frohner Meadows Pillow	6480	12/29	SP	5.5	2.0	-
Garver Creek Pillow	4250	12/29	SP	6.5	-	4.8
Gibbons Pass	7100	12/29	57	17.0	3.8	9.5
Grave Creek	4300	12/28	36	12.0	-	-
Grave Creek Pillow	4300	12/28	SP	11.3	4.0	-
Grizzly Peak	8400	12/27	26	5.4	3.2	8.7
Hand Creek	5030	12/15	30	6.6	-	-

Average based On 1958-72 period. A - Aerial observation; water content estimated.

SP - Snow Pillow observation; water content only.

SNOW

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average
Hand Creek Pillow	5030	12/15	SP	7.3	3.0	-
Hawkins Lake Pillow	6450	12/29	SP	15.8	-	13.3
Hebgen Dam	6550	12/29	31	8.4	2.6	4.6
Hell Roaring Divide	5770	12/28	58	17.2	7.2	14.1
Highwood Divide	5650	12/28	24	6.5	5.2	-
Highwood Station	4600	12/28	12	3.1	3.8	-
Holbrook	4530	12/26	42	8.5A	4.0	4.3
Hood Meadow	6600	12/28	22	4.8	2.2	4.5
Hoodoo Basin Pillow	6000	12/27	SP	26.4	6.4	19.1
Island Park (ID)	6310	12/29	30	7.9	1.4	6.1
Kings Hill	7500	12/27	35	8.8	4.3	-
Kiwanis Camp	3720	12/29	20	3.2	-	-
Lake Creek	6100	12/29	19	3.6	1.1	-
Lakeview Canyon	6930	12/23	16	2.7	-	5.4
Lakeview Ridge	7400	12/23	15	2.8	-	5.0
Lick Creek	6860	12/28	23	4.8	1.9	3.9
Lick Creek Pillow	6860	12/28	SP	4.0	4.3	4.0
Lolo Pass (ID)	5230	12/29	62	19.8	4.2	11.7
Lolo Pass Pillow	5230	12/27	SP	17.4	-	-
Lone Mountain	8880	1/02	46	14.0	4.7	9.8
Lookout (ID)	5250	12/28	62	22.0	4.8	15.6
Lost Horse	5940	12/28	65	22.8	5.9	12.0
Lubrecht Flume	4200	12/28	20	4.7	1.2	3.1
Lubrecht Forest #3	5450	12/28	21	5.0	1.2	3.2
Lubrecht Forest #4	4650	12/28	12	2.7	.7	1.8
Lubrecht Forest #6	4040	12/30	17	3.5	.6	1.8
Lubrecht Hydroplot	4200	12/28	19	4.2	1.0	2.7
Lupine Creek (WY)	7300	1/03	28	3.1	1.6	4.4
Madison Plateau	7750	12/29	42	11.7	2.1	8.7
Madison Plateau Pillow	7750	12/29	SP	11.8	4.4	9.4
Marias Pass	5250	12/29	32	8.8	2.8	7.7
Maynard Creek	6210	12/29	37	11.0	3.0	7.4
Maynard Creek Pillow	6210	12/29	SP	6.4	4.3	5.4
Meadow Creek Pillow	4000	12/29	SP	4.1	3.4	-
Moose Creek (ID)	6200	12/31	48	14.8	-	5.6
Moulton Reservoir	6850	12/30	22	2.6	.9	-
Mount Lockhart Pillow	6400	12/12	SP	13.2	4.2	8.3
Newton Mountain	5600	12/29	59	18.5	4.6	-
Nez Perce Camp	5580	12/29	39	10.6	-	-
Nez Perce Camp Pillow	5580	12/29	SP	10.9	3.4	-
Nez Perce Pass	6570	12/29	44	14.2	-	-
Noisy Basin	6040	12/14	72	22.4	14.9	-
Noisy Basin Pillow	6040	12/14	SP	17.3	12.2	-
North Fk. Elk Creek	6250	12/29	31	8.2	2.0	5.6
North Fk. Elk Creek Pillow	6250	12/29	SP	7.9	2.0	4.7
Northeast Entrance	7400	12/31	32	7.6	2.6	3.6
Northeast Entrance Pillow	7400	12/31	SP	7.9	1.8	4.0
Old Faithful (WY)	7360	1/02	39	9.6	1.5	-
Ophir Park	7150	12/30	45	12.1	4.0	-
Peterson Meadow	7200	1/03	24	6.4	2.0	3.8
Peterson Meadow Pillow	7200	1/03	SP	5.1	1.6	-
Pike Creek Pillow	5930	12/13	SP	13.0	6.0	-

Average based On 1958-72 period. A - Aerial observation; water content estimated.

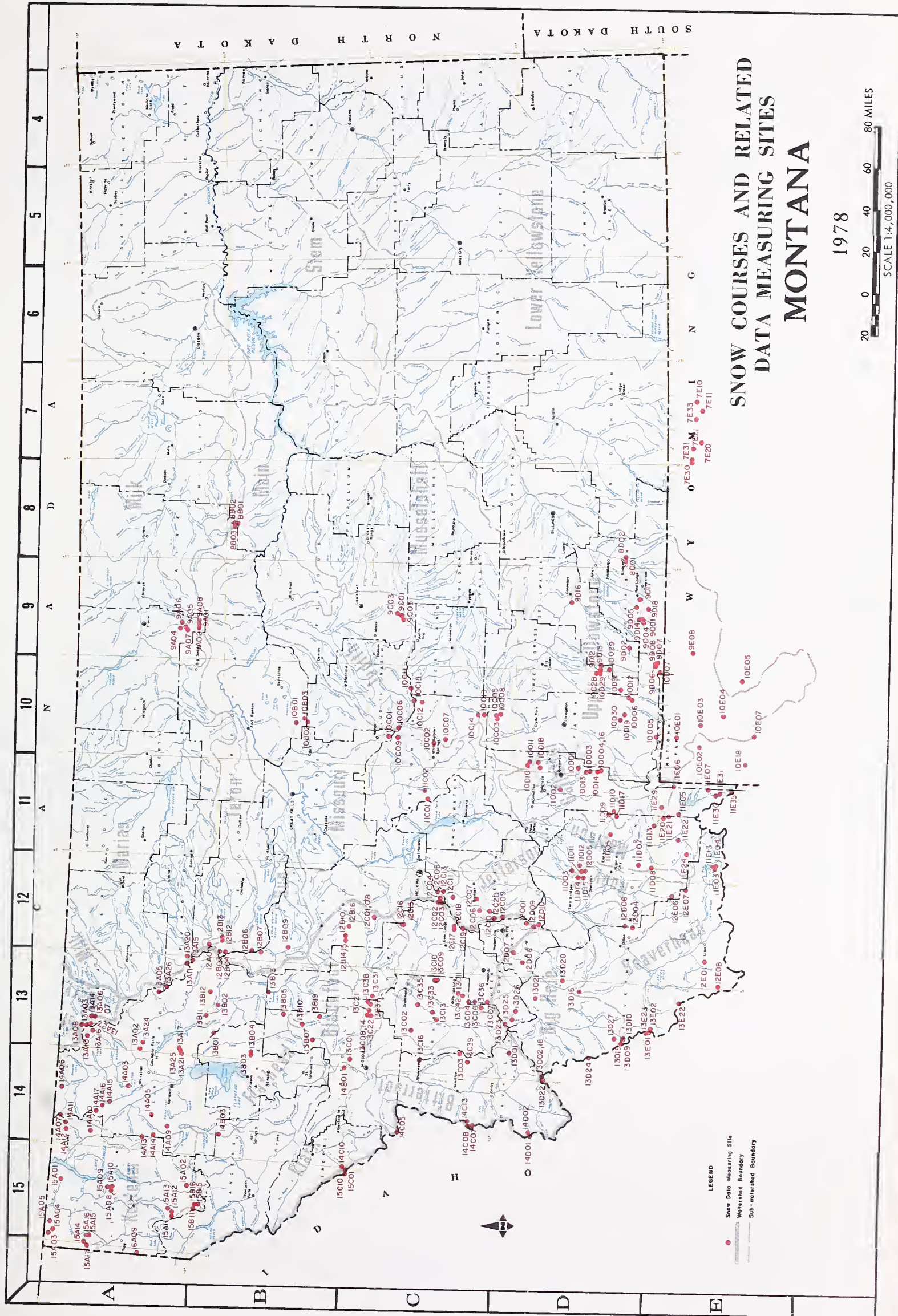
SP - Snow Pillow observation; water content only. -11-

SNOW

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
					Last Year	Average
NAME	Elevation					
Pipestone Pass	7200	12/30	12	2.4	.0	2.3
Poorman Creek Pillow	5100	12/23	SP	18.0	-	14.2
Red Top	5260	12/29	52	17.2	4.4	-
Rocker Peak	8000	12/28	35	9.9	2.3	6.8
Rocker Peak Pillow	8000	12/28	SP	9.6	2.1	7.2
Rocky Boy	4700	12/29	21	5.2	1.6	1.8
Rocky Boy Pillow	4700	12/29	SP	5.2	2.4	1.4
Saddle Mountain	7940	12/29	60	19.4	4.2	10.3
Saddle Mountain Pillow	7940	12/29	SP	19.1	4.3	11.6
Savage Pass (ID)	6600	12/29	59	18.2	3.9	8.3
Sawtell Mountain (ID)	8710	12/29	52	15.0	1.5	14.0
Shower Falls	8100	12/28	54	15.3	7.6	11.0
Shower Falls Pillow	8100	12/28	SP	13.6	7.9	11.5
Silver Run Pillow	6630	12/28	SP	1.5	1.1	-
Skalkaho Summit	7260	12/28	59	18.1	-	-
Skalkaho Summit Pillow	7260	12/28	SP	17.5	3.2	-
Spotted Bear Mountain	7000	12/26	46	11.0A	3.5	7.2
Spur Park	8000	12/27	51	14.4	6.1	9.2
Spur Park Pillow	8100	12/27	SP	16.2	7.6	10.2
Stahl Peak	6050	12/28	72	24.2	-	-
Stahl Peak Pillow	6050	12/28	SP	20.4	8.9	-
Storm Lake	7780	1/03	35	8.8	3.0	5.6
Sylvan Pass (WY)	7100	1/01	43	10.5	2.3	5.7
Sucker Creek	3960	12/29	10	1.2	.3	-
Targhee Pass (ID)	7000	12/29	25	6.3	2.0	6.5
Taylor Road	4080	12/29	23	5.6	1.4	-
Ten Mile Lower	6600	12/30	24	5.2	1.9	3.1
Ten Mile Middle	6800	12/30	33	7.3	2.0	4.9
Ten Mile Upper	8000	12/30	33	8.7	3.2	6.0
Tepee Creek	8000	12/29	34	8.6	1.9	-
Tepee Creek Pillow	8000	12/29	SP	8.0	2.0	-
Thumb Divide (WY)	7900	12/28	41	9.9	1.3	9.2
Togwotee Pass (WY)	9600	12/29	72	21.3	3.7	13.4
TV Mountain	6800	12/26	43	10.4	1.9	8.0
Twelvemile Creek	5600	12/28	49	15.2	4.8	7.2
Twelvemile Creek Pillow	5600	12/28	SP	11.8	3.4	6.2
Twenty-one Mile	7150	12/29	39	10.6	2.2	7.3
Twin Creeks	3580	12/26	42	9.5A	2.5	5.7
Twin Lakes	6510	12/28	85	30.0	5.8	15.5
Twin Lakes Pillow	6400	12/28	SP	29.2	6.7	16.5
Valley View (ID)	6500	12/29	26	6.2	1.4	6.3
Waldron Pillow	5600	12/12	SP	7.3	2.6	5.2
Weasel Divide	5450	12/28	68	21.7	-	-
West Yellowstone	6700	12/29	25	6.0	.9	4.6
West Yellowstone Pillow	6700	12/27	SP	4.2	.7	3.8
Whiskey Creek	6800	12/29	41	10.8	2.1	-
Whiskey Creek Pillow	6800	12/29	SP	8.8	2.4	-
White Elephant (ID)	7700	12/29	46	12.6	.7	-
White Mill	8700	12/27	73	21.0	5.2	-
White Mill Pillow	8700	12/27	SP	18.4	6.1	-
Willow Creek	6500	12/28	20	3.4	1.5	-
Wolverine (WY)	7650	12/30	37	9.2	-	-

Average based On 1958-72 period. A - Aerial observation; water content estimated.

SP - Snow Pillow observation; water content only. -12-



SNOW COURSES AND RELATED
DATA MEASURING SITES
MONTANA

1978



INDEX to MONTANA SNOW COURSES and DATA SITES

SNOW COURSES
COLUMBIA RIVER BASIN

[illegible]

HUDSON BAY BASIN

ST. MARY RIVER						
Iceberg Lake No. 3	5600	1	35N	17W	5	3.9
Jacobson Lower No. 9	4900	22	35N	16W	5	3.9
McKenney No. 1	5100	22	35N	16W	5	3.9
Mount Aiken No. 7	1,007	5700	35N	16W	5	3.4, 5
Mount Aiken No. 8	1,007	5700	35N	16W	5	3.9
Mount Pass. No. 6	1,306	5,520	27	15W	16W	3.9
Summit Pass. No. 6	1,306	5,520	27	15W	16W	3.9

MISSOURI RIVER BASIN

[illegible]

ring Pass	13A05	5250
ant Lockhart	12B12	6400

Pike Creek	13A26	5	29N	S.P.F.	
Malden	13B07	32	28N	S.P.F.	1.2, 3.4, 5, 5h, 6
Long Creek	12B02	5700	32	28N	1.2, 3.4, 5, 5h, 6
Wong Ridge	12B03	6800	17	25N	1.0h

JUDITH RIVER

Big Bend	9005	7150	25	12N	17E	
Big Lake	9020	6140	1	12N	18E	
Rock Creek	9033	5600	7	12N	18E	P,S,T
Spar Park	10006	6000	20	12N	9E	S,P,T

MUSSELSHELL RIVER

Daya Peak	10C15	7600	34	11E	P	
Eagle Creek	10C13	7000	2	5N	10E	
Foreman Lake	10C14	6400	26	6N	10E	
Naymaker	10C11	8050	16	11N	12E	
Johnson Park	10C12	6650	16	10N	11E	

MILK RIVER

Beaver Creek	9A05	3950	21	29N	16E	M,NSC
Four Paw Ski Area	9A02	5200	21	28N	16E	P
King Creek	9A02	4550	10	28N	24E	P
King Creek Saddle	9A02	4550	10	28N	24E	P
KLing SprLing	9A03	4150	9	25N	24E	P
KLingLing Camp	9A04	3720	9	29N	14E	P,4,T
Manion Mountain	9A01	5050	15	25N	24E	P
Rocky Bay	9A01	5700	22	28N	16E	S,P,H
Rocky Bay Creek	9A01	5700	22	28N	16E	P
Taylor Road	9A07	4080	19	29N	16E	P

UPPER YELLOWSTONE RIVER

Bald Ridge	10C05	7500	11	4N	10E	
Battle Ridge	10C11	6020	32	2N	7E	M
Boen Sota	9014	7750	35	7N	18E	
Box Canyon	10D31	6700	28	65	12E	
Braan Monkey	10D29	9050	6	55	14E	P,NSC
Camp Senia	9001	7850	2	95	18E	Seasonally
Camp Senia	9001	7850	2	95	18E	Seasonally
Colley Creek	10D30	6300	34	63	10E	S,P,T
Cooker Station	9007	8150	19	95	15E	P
Crovice Mountain	10005	8400	22	95	9E	
Fisher Creek	9006	9100	11	95	14E	S,P,T
Grizzly Peak	10D32	7850	25	75	12E	
Grizzly Peak	10D32	7850	25	75	12E	
Mill Creek	10D19	7850	6	75	11E	P
Monument Peak	10D12	8800	16	75	12E	S,P,T
Northeast Entrance	10007	7400	33	95	14E	S,P,H,T
Picket Fin Lower	9013	8200	1	55	14E	P
Picket Fin Lower	9013	8200	1	55	14E	P
Picket Fin Upper	10D28	3100	32	65	13E	P
PMC Dryland	10D38	6700	35	65	23E	M,NSC
PMC Headquarters	9001	3656	34	65	23E	P,M,T,NSC
Porecupine	10C03	6500	10	4N	10E	S,P,T
Redwood	10C11	6550	10	4N	10E	S,P,T
Shaw Peak	9018	8250	11	85	19E	S,P,T
South Fork Shialda	10C08	8100	13	4N	10E	
Timberline Creek	9004	8850	10	85	18E	
Unobehud	9002	7500	9	75	16E	
White Hill	9008	8700	18	95	15E	S,P,T
Whitlow Creek	9017	6500	31	75	20E	

LEGEND

Big Bend	9005	7150	25	12N	17E	
Big Lake	9020	6140	1	12N	18E	
Rock Creek	9033	5600	7	12N	18E	P,S,T
Spar Park	10006	6000	20	12N	9E	S,P,T

1,2,3,4,5,5H,6

Daya Peak	10C15	7600	34	11E	P	
Eagle Creek	10C13	7000	2	5N	10E	
Foreman Lake	10C14	6400	26	6N	10E	
Naymaker	10C11	8050	16	11N	12E	
Johnson Park	10C12	6650	16	10N	11E	

1,2,3,4,5,5H,6

Beaver Creek	9A05	3950	21	29N	16E	M,NSC
Four Paw Ski Area	9A02	5200	21	28N	16E	P
King Creek	9A02	4550	10	28N	24E	P
King Creek Saddle	9A02	4550	10	28N	24E	P
KLing SprLing	9A03	4150	9	25N	24E	P
KLingLing Camp	9A04	3720	9	29N	14E	P,4,T
Manion Mountain	9A01	5050	15	25N	24E	P
Rocky Bay	9A01	5700	22	28N	16E	S,P,H
Rocky Bay Creek	9A01	5700	22	28N	16E	P
Taylor Road	9A07	4080	19	29N	16E	P

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Bald Ridge	10C05	7500	11	4N	10E	
Battle Ridge	10C11	6020	32	2N	7E	M
Boen Sota	9014	7750	35	7N	18E	
Box Canyon	10D31	6700	28	65	12E	
Braan Monkey	10D29	9050	6	55	14E	P,NSC
Camp Senia	9001	7850	2	95	18E	Seasonally
Camp Senia	9001	7850	2	95	18E	Seasonally
Colley Creek	10D30	6300	34	63	10E	S,P,T
Cooker Station	9007	8150	19	95	15E	P
Crovice Mountain	10005	8400	22	95	9E	
Fisher Creek	9006	9100	11	95	14E	S,P,T
Grizzly Peak	10D32	7850	25	75	12E	
Grizzly Peak	10D32	7850	25	75	12E	
Mill Creek	10D19	7850	6	75	11E	P
Monument Peak	10D12	8800	16	75	12E	S,P,T
Northeast Entrance	10007	7400	33	95	14E	S,P,H,T
Picket Fin Lower	9013	8200	1	55	14E	P
Picket Fin Lower	9013	8200	1	55	14E	P
Picket Fin Upper	10D28	3100	32	65	13E	P
PMC Dryland	10D38	6700	35	65	23E	M,NSC
PMC Headquarters	9001	3656	34	65	23E	P,M,T,NSC
Porecupine	10C03	6500	10	4N	10E	S,P,T
Redwood	10C11	6550	10	4N	10E	S,P,T
Shaw Peak	9018	8250	11	85	19E	S,P,T
South Fork Shialda	10C08	8100	13	4N	10E	
Timberline Creek	9004	8850	10	85	18E	
Unobehud	9002	7500	9	75	16E	
White Hill	9008	8700	18	95	15E	S,P,T
Whitlow Creek	9017	6500	31	75	20E	

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CE.ND.

* SNOTEL site--data transmitted daily by telemetry

[illegible]

I/ BLANK RETURN TO SNOW COURSE ONLY AT HITE
S = snow pillow also

P = precipitation gave also

M = total moisture base also
T = max-min temperature also

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W = wind run also
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NSC = no snow course at alto

$\gamma_1 \quad \gamma_2, \dots, \gamma_n = 1 \quad \gamma_1 \in \Gamma, \quad \gamma_2, \dots, \gamma_n \in \Gamma^*$

NUMERICAL 1, 2, 3, 4, 5, 25, 6 RETOR TO KNOW
February 1, March 1, April 1, May 1, May

and wind run are daily readings, most pre-

MONETARY,

3/ Numerals refer to agency making the snow

1, Soil Conservation Service	8.
2, Forest Service	9.

3. Geological Survey 10.

4. Montana Power Company 11.
5. Bureau of Indian Affairs 12.

6, National Park Service	13.
7, McIlhenny National Monument	14.

1, 150 AGRICULTURAL EXPERIMENT
Station
14,
15,

Agencies and Organizations Cooperating in Montana Snow Surveys

GOVERNMENT AGENCIES

Canada:

Water Survey of Canada, Calgary, Department of the
Environment
Water Resources Service, Department of Lands, Forests
and Water Resources, British Columbia
Alberta Environment, Edmonton, Alberta

Federal:

Department of the Army
Corps of Engineers
U.S. Department of Agriculture
Forest Service
Soil Conservation Service
U.S. Department of Commerce
NOAA, National Weather Service
U.S. Department of the Interior
Bonneville Power Administration
Bureau of Indian Affairs
Bureau of Reclamation
Fish and Wildlife Service
Geological Survey
National Park Service

STATE

Montana Conservation Districts
Montana Department of Fish and Game
Montana Department of Natural Resources and
Conservation
Montana State University - Agricultural Experiment
Station
University of Montana - School of Forestry
DNRC - State Forester

PRIVATE

Montana Power Company
Butte Water Company
The Anaconda Company

Other organizations and individuals furnish valuable
information for snow survey reports. Their cooperation
is gratefully acknowledged.

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*"The Conservation of Water begins
with the Snow Survey"*

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